PA 1052942

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

August 14, 2003

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: ***60/404,918***
FILING DATE: ***August 22, 2002***

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH
RULE 17.1(a) OR (b)

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

L. Edelen

L. EDELEN
Certifying Officer

Approved for use through 01/31/98. OMB 0651-0037
Patent and Trademark Office; US DEPARTMENT OF COMMERCE

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a **PROVISIONAL APPLICATION FOR PATENT** under 37 CFR 1.53 (b)(2).

Docket Number	25013	Type a plus sign (+) inside this box ->	+

INVENTOR(s) / APPLICANT(s)

LAST NAME	FIRST NAME	MIDDLE INITIAL	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)
GOLAN	Gad		Hod Hasharon, Israel

TITLE OF THE INVENTION (280 characters max)

DISPLAY DEVICES

CORRESPONDENCE ADDRESS

G. E. EHRLICH (1995) LTD.
c/o ANTHONY CASTORINA
2001 JEFFERSON DAVIS HIGHWAY
SUITE 207

STATE	VIRGINIA	ZIP CODE	22202	COUNTRY	USA

ENCLOSED APPLICATION PARTS *(check all that apply)*

☑ Specification	*Number of Pages*	16	☑ Applicant is entitled to Small Entity Status
☑ Drawing(s)	*Number of Sheets*	14	☑ Other (specify) *ASSIGNMENT*

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

☐ A check or money order is enclosed to cover the filing fees ☑ The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number: 50-1407	FILING FEE AMOUNT ($)	$ 80.-

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☑ No

☐ Yes, the name of the US Government agency and the Government contract number are: ______________

Respectfully submitted,

SIGNATURE ______________ August 22, 2002
Date

TYPED or PRINTED NAME SOL SHEINBEIN

25,457
REGISTRATION NO.
(if appropriate)

☐ Additional inventors are being named on separately numbered sheets attached hereto

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

DISPLAY DEVICES

Inventor: Gady Golan

FIELD OF THE INVENTION

The present invention relates to display devices. More particularly it relates to a low power consumption, timed controlled, flexible Light Emitting Diode (LED) display, for touch panel smart cards.

BACKGROUND OF THE INVENTION

Luminescent materials

Flat and flexible light emission can be achieved in several ways. The first is by using luminescent materials (as done in our prior art).

These are materials in which hole-electron generation, or excitation of deep impurity electrons from their normal low-energy level, to a higher and empty impurity level (with both in the forbidden gap), is followed by a return to equilibrium via photon emission in the visible spectral range. The exact wavelength, i.e. color, is a characteristic of the material or impurity. The original excitation can be caused by absorption of high-energy photons (photoluminescence) or by bombardment with high-energy electrons (cathode-luminescence). Recombination and photon emission usually take place in several stages and these materials are called phosphors. ZnS is such a semiconductor, to which Cu, Ag, or Mn impurities are added to bring the emission into the visible spectrum with each giving different color.

Light Emitting Diodes (LED)

Light emitting diodes (or LEDs) utilize the recombination of the excess carriers, injected in a forward biased diode, to obtain light emission for display purposes. In case of a direct band-gap semiconductors, like GaAs, both conduction electrons and holes have very low

momentum values. Direct radiative recombination is therefore very likely and it is such semiconductors that are used for light generation. In a forward biased GaAs diode the injected carriers recombine relatively, but the emission is in the near I.R. (NIR), about 0.85 microns. The radiation intensity is proportional to the concentration of excess minority carriers and therefore to the forward current. GaAs LEDs can't be used for displays since the wavelength is beyond the visible range. But the compound semiconductor GaAsxP1-x (Gallium Arsenide Phosphide) has a band-gap which depends on x, the Arsenic percentage. At x=0.44 the band-gap is still direct but the emitted light is red and visible. Parallel connection of many LEDs may be used to display numbers and letters. A common way to display a whole number is by the seven-segment system with each segment possibly composed of several LEDs arranged in a line. A digital control system is used to direct the current to the desired segment. The advantages of LEDs compared to other lamps are their high efficiency, long operating lifetimes, mechanical sturdiness, and ability to operate from low voltage supplies, compatible with transistor circuits.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates a bar diagram of a typical embodiment of the flexible LED display device according to the present invention.

Fig. 2 illustrates three optional arrangements of the LED display device according to the present invention, in smart cards.

Fig. 3 illustrates a general definition of a Moneo smart card.

Fig. 4 (a, b) illustrates an optional positioning of the Flexible LED display and the operating buttons, according to the present invention, in smart cards.

Fig. 5 illustrates an optional arrangement of a PCB design according to ISO 7816 of a LED display device, according to the present invention, in smart cards.

Fig. 6 illustrates an optional arrangement of electrical diagram of five seven segments LED display digits, according to the present invention, in smart cards.

Fig. 7 (a, b) illustrates an optional assembly arrangement of the five seven segments LED display digits, according to the present invention.

Fig. 8 (a, b, c, d, e) illustrates an optional arrangement of five seven segments LED display digit readouts, according to the present invention, in smart cards.

DETAILED DESCRIPTION OF THE INVENTION AND FIGURES

In order to better understand the present invention, and appreciate its practical applications, the following Figures are provided and referenced hereafter. It should be noted that the Figures are given as examples only and in no way limit the scope of the invention as defined in the appending Claims. Like components are denoted by like reference numerals.

It should be clear that the description of the embodiments and attached Figures set forth in this specification serves only for a better understanding of the invention, without limiting its scope as covered by the following Claims.
It should also be clear that a person skilled in the art, after reading the present specification could make adjustments or amendments to the attached Figures and above described embodiments that would still be covered by the following Claims.

Light Emitting Diode (LED) technology is known for more than 20 years and used in producing light emitting displays. As LED display is a bulk device, thick and rigid, it was never used as a readout display for smartcard applications. LED display needs a large space, whereas smartcards requirements are that smartcards be of relatively small height dimensions. Current smartcards consist only of passive built-in chips with flash memories

which need an external stationary energy source for the Read/Write process and for the status verification process.

Flexible LED display is composed of thin semiconductor dot diodes in a seven segments structure. When subjected to direct current (DC) excitation starts and light is being emitted as a result. The high efficiency attributed to LED, accounts for its relatively low heat dissipation. Therefore, LED light dots consume low electric power and do not heat up substantially.

The known disadvantages of current known prior art smartcards are:

1. Lack of a readout interface.

2. Lack of a reliable, thin and flexible energy source (battery).

3. Lack of real-time card-control during the Read/Write process (from the card's side).

4. Can be the subject of an unlawful and unauthorized use in case of theft.

5. Can be used for one application at most.

6. Cannot be programmed by the end-user.

7. LCD readouts are known to be carcinogenic (made of organic Benzen Rings).

US Patent 5,731,105 (Fleischer et al.), incorporated herein by reference, discloses a non-liquid electrolyte containing battery power source which operates efficiently at room temperature. The battery includes (1) a non-liquid electrolyte in which protons are mobile. (2) an anode active material based on an organic compound which is a source of protons during battery discharge, or an anode active material including a metal whose caton can assume at least two different non-zero oxidation numbers, and (3) a solid cathode including a compound which forms an electrochemical battery couple with the anode. Anode and Cathode active materials can be chosen so that the battery has the feature that the electrochemical reactions at the anode and cathode are at least partially reversible. It is suitable for electronic consumer products, biochemical applications,

electric vehicle applications, and the like. The battery can be fabricated in any desired shape or size without any special production precautions. An important feature of the battery is that no thermal activation is required for its operation, therefore, the battery efficiently operates under ambient temperatures.

US Patent 5,382,481 (Fleischer et al.), incorporated herein by reference, discloses an all solid state battery power source which operates efficiently at room temperature. The battery includes (1) a solid state electrolyte in which protons are mobile, (2) an anode active material based on an organic compound which is a source of protons during battery discharge, or an anode active material including a metal whose caton can assure at least two different non-zero oxidation numbers and (3) a solid cathode including a compound which forms an electrochemical battery couple with the anode. Anode and cathode active materials can be chosen so that the battery has the feature that the electrochemical reactions at the anode and cathode are at least partially reversible. It is suitable for electronic consumer products, biochemical applications, electric vehicle applications, and the like. The battery can be fabricated in any desired shape without any special production precautions.

See also US patent: 5,512,391, US patent: 5,580,681, all to Fleischer et al., incorporated herein by reference.

To the best knowledge of the inventor there are no EL readouts in smartcards, and there are no batteries in smartcards that are less than 0.5 mm thick, rechargeable, flexible and providing 10mA-h or similar power.

In WO Pat. Application No. 9,631,730 (Huwitz) an illuminated protective encapsulation for the phosphor was disclosed. It comprised a protective shell with a power unit in it. The EL lamp is secured to the shell and is operated by a power unit, providing intermittent illumination.

In JP Pat. Application (assigned to Nippon Kasei KK) a road sign for pedestrians or vehicles was disclosed. A pair of ultrasonic sensors are arranged on the pavement, and

send a signal to a control unit which controls the power feed to an electroluminescent (EL) element. A solar battery serves as the power supply.

US Pat. No. 5,359,341 (Hutchings) disclosed a power supply for sequentially energizing segments of an EL panel to produce animated displays. An electronically programmable EPROM programmed with a predetermined sequence for an EL graphic display controls the sequence of powering (or not powering) of each segment of the EL display.

It is the purpose of the present invention to provide an EL display device, with versatile uses, including constant, intermittent or sequential powering of the EL panel.

The flexible LED display device of the present invention typically comprises alphanumerical, or seven segments, Led display plus a flexible non-rechargeable/rechargeable thin flat battery, for smartcard applications, and has the following characteristics:

1. Low power consumption.

2. Bright readout (typically of more than 4 Cd/cm^2)

3. Easy to read under most types of conventional illuminations.

4. Flexible as required in conventional smartcards standardization.

5. Thin and flexible electronics circuitry (feasibly less than 0.5 mm in thickness).

6. Thin (about 0.4 mm) rechargeable or non- rechargeable flexible battery of 10 mA-h.

7. Panel typically consisting of 5 digits (0-9) and a fixed decimal point.

8. Timing circuitry for energy saving.

9. Low weight of the electrical components.

10. Can be programmed by the end-user (credit card companies).

11. Can become a multipurpose smart card following an appropriate encoding, done by the end user (credit card companies).

12. Can be password-protected.

13. During the Read/Write process, electrical energy is drawn from the point of sale and not from the internal battery of the smart card.

14. The Lcd display materials as well as the battery are made of "green materials". They are of no hazards to the environment and they are not known as carcinogenic materials.

The novel aspects of the said invention and its new features are as follows:

1. Ultra thin LED dots (up to 200 microns) arranged in a seven segments configuration. The segment structure is achieved using a mask and a special epoxy resin for LED displays.

2. Wire bonding of the small dots to a 150 microns thick PCB. (up to now it was possible to bond only 300 microns thick PCBs).

3. Energy management.

There will be two energy modes in the smart card with display:

A. While transaction with the terminal (loading money or re-loading money), energy to the card will be drawn from the terminal (5V). This energy is necessary for the clock and saving in the display controller.

B. While normal operation - verification of currency status, energy will come from the internal battery (3 V).

4. Low power consumption.

The LED readout average consumption is less than 1.5 mA. This feature is achieved by the miniature LED dots instead of the conventional segments.

5. Bright readout of more than 4 Cd/cm^2.

The high intensity readout is achieved by a dedicated epoxy resin for LED displays.

6. Easy to read under most types of conventional illuminations.

Unlike LCD readouts, which need an external illumination (back light), the EL readout is an illumination source typically of red light.

7. Flexible as required in conventional smart card standardization.

The LED readout of the device of the present invention can be bent and folded and still keep on working without degrading its performance.

As the printed circuit board (PCB) is flexible as well as the readout (dot LEDs), they can be bent much more than the required standard.

8. Thin and flexible electronic circuitry (less than 0.5 mm in thickness).

Maximum thickness of the electrical components (already installed on the PCB in a special assembly process), is less than 0.5 mm.

9. Thin (0.4 mm) and flexible battery of 25 mA-h (a 50 mA-h is optional).

Incorporating patented battery (see US Patent 5,731,105, US Patent 5,382,481, US patent: 5,512,391, US patent: 5,580,681), or other batteries i.e. Varta or NTK.

10. Two buttons key pad for alternating operation modes as an electronic purse, as a credit card and as a loyalty card.

Since there are no current keypads on conventional smartcards, our invention is in the digitized panel of smartcards.

11. Timing circuitry for energy saving.

Readout time was taken between one to four seconds in order to save as much energy power as possible. A reading session will consist of: balance, five last transactions, all accompanied by dates.

12. Low weight of the electrical components.

The total weight of the electronic circuit is less than 10 grams.

13. Programming by the end-user (smart card companies).

Instead of the conventional magnetic bar, present in conventional bank cards, which can be duplicated and stolen, the smart card device of the present invention can be programmed for encoding and decoding purposes.

14. The LED materials as well as the battery's materials, are made of "green materials". They are of no hazards to the environment and they are not known as carcinogenic materials.

The LED display is equivalent to a semiconductor diode, with an epoxy resin on top. A typical LED structure consists of a dot LED matrix, assembled on a thin and flexible PCB. The dots are then masked and glued to achieve a segment structure.

Light emitting diode utilizes the recombination of the excess carriers, injected in a forward biased diode, to obtain light emission for display purposes. In case of a direct band-gap semiconductors, like GaAs, both conduction electrons and holes have very low momentum values. Direct radiative recombination is therefore very likely and it is such semiconductors that are used for light generation. In a forward biased GaAs diode the injected carriers recombine relatively, but the emission is in the near I.R. (NIR), about 0.85 miorons. The radiation intensity is proportional to the concentration of excess minority carriers and therefore to the forward current. GaAs LEDs can't be used for displays since the wavelength is beyond the visible range. But the compound semiconductor GaAsxP1-x (Gallium Arsenide Phosphide) has a band-gap which depends on x, the Arsenic percentage. At x=0.44 the band-gap is still direct but the emitted light is red and visible.

Integration of EL readouts in smart card applications was never done before as no electrical energy source was thin enough to be incorporated in a thin plastic card. Other factors impeding the integration of LED readouts in smart cards were: the necessity in high flexibility of the whole system (including the electronic circuitry), the necessity in no more than 0.5 mm thickness electronic circuitry and the necessity in low consumption electronics, in order to enable hundreds of operations before recharging the built-in battery. Above all these factors, the materials comprising the EL readout and the sheet battery, should be made of "green" materials that are not hazardous to the environment.

The present invention introduces a flat and thin battery, as a source of energy, in connection with a smart card. This energy source of up to 50 mA-h is mechanically flexible, and of less than 0.5 mm thick. Using this special flat source of energy, a LED flat readout and its adjoining electronic circuitry were designed and fabricated. The total thickness of the electronic circuitry is less than 0.5 mm, it is mechanically flexible, and its power consumption is tuned to minimum in order to meet the thin battery requirements. Expansion of the electronic circuitry includes timing control for the active readout in order to save in electric power, and a key pad touch buttons for the smart card users.

The flexible LED display device of the present invention comprises:

- at least one of a number of LED seven segments of predetermined shape, size and color of emitted light;
- a DC power supply (a flat and flexible battery);
- a DC separator between the internal battery and the external one;
- a power driver;
- an oscillator;
- a switching unit; and
- a control unit

wherein said oscillator controls the currency transactions of the entire system, wherein said DC separator separates between internal and external voltage, to activate said LED seven segments through said switching unit which is provided with On and Off controllable conditions for powering or not powering the LED segments, wherein said control unit controls the system and output, and wherein said control unit controls the system to provide predetermined sequence of powering of said LED seven segments thus producing alternating lighting or animated effects in said flexible LED seven segments.

The flexible LED display device of the present invention is hereafter explained with reference to the attached Figures.

Fig. 1 illustrates a bar diagram of a typical embodiment of the flexible LED display device according to the present invention. Fig. 2 illustrates three optional arrangements of the LED display device according to the present invention, in smart

cards. Fig. 3 illustrates a general definition of a Moneo smart card. Fig. 4 (a, b) illustrates an optional positioning of the Flexible LED display and the operating buttons, according to the present invention, in smart cards. Fig. 5 illustrates an optional arrangement of a PCB design according to ISO 7816 of a LED display device, according to the present invention, in smart cards. It is a 125 microns PCB, temporary glued to 300 microns FR-4 substrate. This extra layer is removed later on. Fig. 6 illustrates an optional arrangement of electrical diagram of five seven segments LED display digits, according to the present invention, in smart cards. Fig. 7 (a, b) illustrates an optional assembly arrangement of the five seven segments LED display digits, according to the present invention. Fig. 8 (a, b, c, d, e) illustrates an optional arrangement of five seven segments LED display digit readouts, according to the present invention, in smart cards.

The DC power supply for the smart card display is preferably a flat battery, or a pile of flat batteries, of small thickness, for easy handling, such as the battery disclosed in US Patent 5,731,105 or in US 5, 382,481. However, a solar cell battery or even the main electric supply can suit. The electrical circuit in Fig. 6 consists of a central Atmel tiny microcontroller, three operating switches, stabilizing tank capacitors, protecting diodes D1 and D2 and a resistor array for current limiting of the LED display.

Optionally, the internal multiplexer at the Atmel micro-controller can be replaced with another controlling hardware or even a computer program controlled control unit. The control unit can send a constant On command, a periodical On/Off signal (blinking) or it can send sequential signals in a predetermined order to provide animated effects. The computer program can be designed to allow end-user programming of the desired sequence of powering commands for each segment in the LED display.

The flexible LED display device of the present invention can be used for commercial credit cards, personal data cards, field kits, electronic purse, receiver cards, loyalty cards and for advertisement applications.

LED DISPLAY STRUCTURE

1. LEDs size - 0.24 X 0.24 mm.

2. Metalization of LEDS - AlGaAs/GaAs.

3. LEDs' Assembly method - Wire Bonding.

4. Bonding material - Silver Epoxy.

5. Wire Bonding - Aluminum Wire.

6. PCB finish - FR 4.

The advantages of the flexible LED device of the present invention, as a display means for smart cards, over the conventional smart cards are as follows:

1. Conventional smart cards do not have, in general, an energy source due to the following problems:

This battery should be thinner than 1 mm, it should be flexible enough to meet the required standards, it should be a heavy duty battery, of at least 5 mA-h.

The present invention employs such battery: Thinner than 0.5 mm, flexible, non-re-chargeable, and heavy duty.

2. Power consumption of conventional LED readout is high if not designed properly.

The present display consists of an advanced design of miniature dot LEDs in a seven segments structure mask coated with a special resin for a LED display. Thus, a bright readout of more than 4 Cd/cm^2 is achieved.

3. Easy to read under most types of conventional illuminations.

As Liquid Crystal Displays (LCD) can not be read in darkness, LED readout can be read either with or without external illumination.

4. Flexible as required in conventional smart cards standardization.

As LCD displays can not be bent, whereas LED readout is easy to bend.

5. Thin and flexible electronics circuitry (less than 0.5 mm in thickness).

This is achieved by employing a thin PCB (100 microns thick).

6. Thin (0.4 mm) flexible battery of at least 25 mA-h.

7. Two dome-buttons for mode selection: Electronic purse, Credit card and a loyalty card.

The smart card can be encode or decode with the required information.

8. Timing circuitry for energy saving.

An auto-stop circuitry ends the readout operation after a given period of seconds (can be programmed).

9. Low weight of the electrical components.

Advantageous on the heavy cards.

10. Can be programmed by the end-user in real-time.

Unlike the conventional cards that can not be programmed either due to lack of means or due to lack of a readout.

11. Can become a multipurpose smart card following an appropriate encoding, done by the end user.

Using the touch-panel each smart card can be varied to any other required credit card.

12. The LED materials as well as the battery are made of "green materials". They are of no hazards to the environment and they are not known as carcinogenic materials.

Unlike the LCD that consists of carcinogenic materials (Benzen rings), the LED is safe to its user and its environment.

It should be clear that the above description of the embodiments of the present invention and the Figures disclosed are given for illustrative purposes only and in no way limit the scope of the invention as defined in the appending Claims.
It should also be clear that a person skilled in the art, after reading the present specification could make adjustments or amendments to the attached Figures and above described embodiments that would still be covered by the following Claims.

CLAIMS

1. A flexible dot LED display device comprising:

- at least one of a number of LED seven segments of predetermined shape, size and color of emitted light;
- a DC power supply;
- a DC tank stabilizer;
- a driver;
- a clock oscillator;
- a switching unit; and
- a control unit
- a wire bonding attachment to a 125 microns thick PCB

wherein said oscillator generates a periodical wave which is used for communicating with the smart chip for read/write purposes.

2. The LED display device according to Claim 1, wherein said power supply comprises a thin flat battery.

3. The LED display device according to Claim 1, wherein said power supply comprises a battery providing up to at least 25 mA-h.

4. The LED display device according to Claim 3, wherein said battery is not more than 0.5 mm in thickness.

5. The LED display device according to Claim 1, wherein said power supply comprises a solar cell battery.

6. The LED display device according to Claim 1, wherein said power supply is the main electric supply.

7. The electroluminescent display device according to Claim 1, wherein said power supply comprises a plurality of batteries.

8. The electroluminescent display device according to Claim 1, wherein said control unit includes a multiplexer which controls the switches of each of the LED seven-segments separately in a predetermined sequence.

9. The electroluminescent display device according to Claim 1, wherein said control unit comprises a computer program controlled control unit.

10. The electroluminescent display device according to Claim 11, wherein said computer program is designed to allow end-user programming of the desired sequence of powering of each segment on the LED display.

11. The LED display device according to Claim 1, wherein said dot LED display are attached on a surface using the wire bonding technique.

12. The electroluminescent display device according to Claim 10, wherein a network of electrical connections to the LED seven segments is provided.

13. The LED display device according to Claim 10, wherein the miniature LEDs segmentation is reduced to very small pixels.

14. The LED display device according to Claim 10, wherein the miniature LEDs segmentation is reduced to very small pixels.

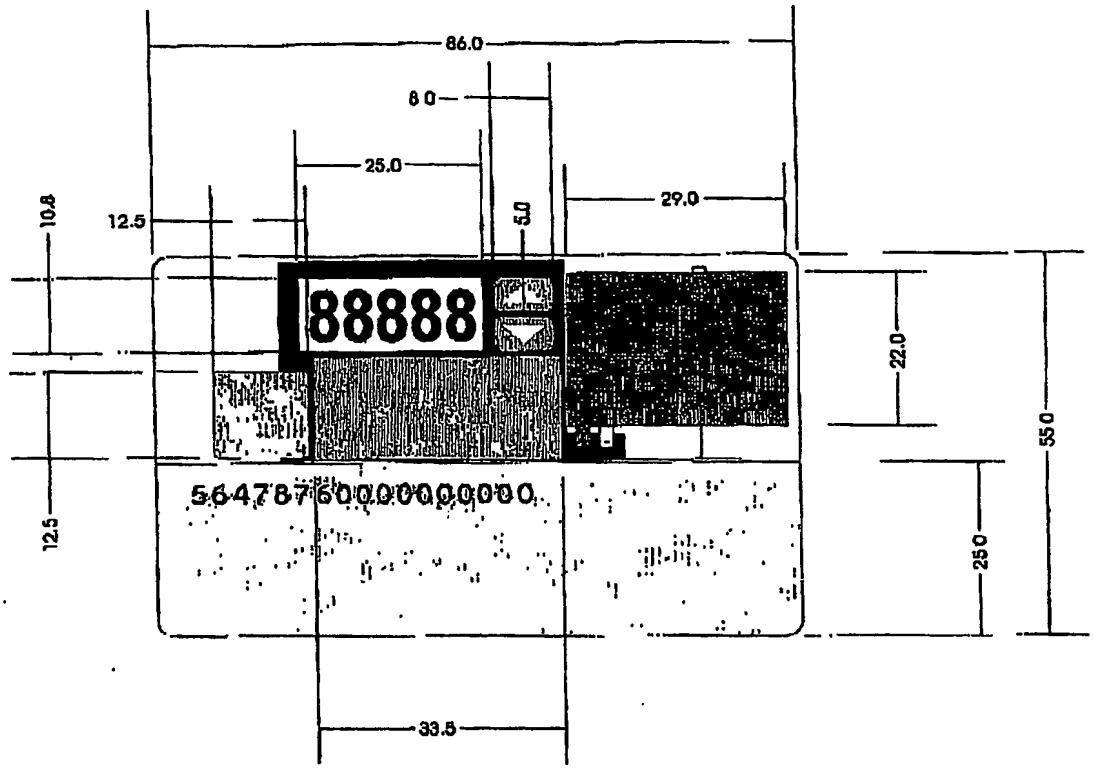
15. The LED display device according to Claim 10, wherein the electrical energy management is divided: electric DC energy is consumed from the terminal during transaction, whereas electrical energy is consumed from the internal battery of the smart card during display.

16. A LED display device according to Claim 1, wherein it is used for an informing sign.

17. An electroluminescent display device according to Claim 1, wherein it is used for commercial advertising.

18. A LED display device according to Claim 1, wherein is used for a business sign.

19. A LED display device substantially as described in the above specification, attached Figures and appending Claims.


86.0
8.0
25.0
5.0
29.0
10.8
12.5
88888
564787600000000000
22.0
55.0
12.5
25.0
33.5

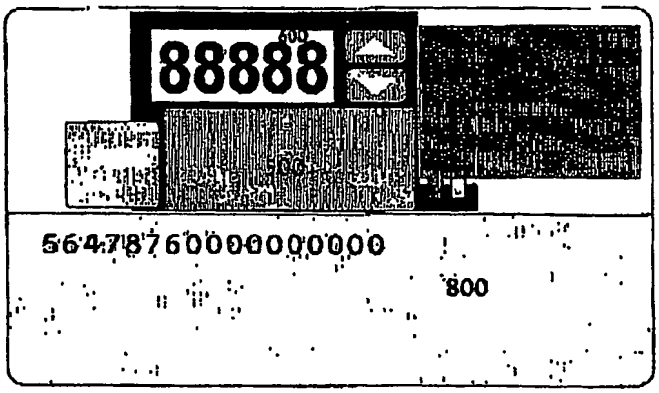

88888
564787600000000000
800

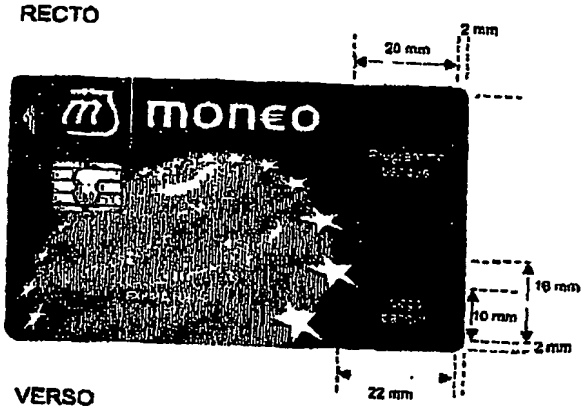
Fig. 1


BNP PARIBAS
VISA
OK
4974
EXPIRE
CARTE BLEUE
moneo
le porte-monnaie électronique
BNP PARIBAS
EXPIRE
OK
CARTE MULTI-FONCTIONS
MR AURELIEN LAURENT
00/00 497499 00000000 00000

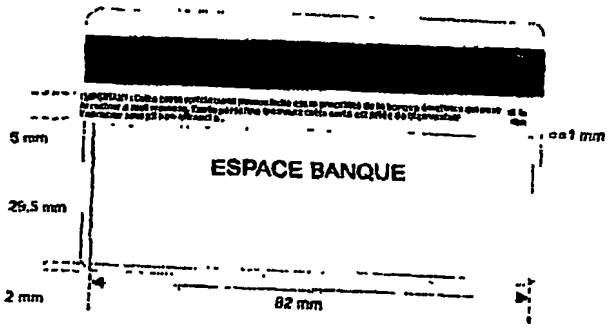
Fig. 2

CARTE MONEO BLEUE RATTACHÉE À UN COMPTE

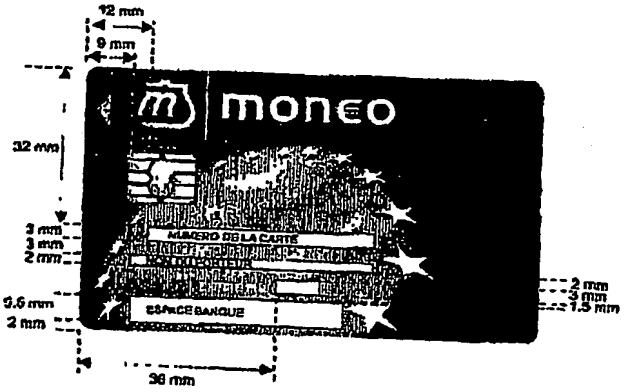
RECTO



VERSO



RECTO



IMPRESSION

RECTO

Visuel : voir illustration disponible sur CD-ROM

Logo Moneo : couleur blanche

Mention "EXPIRE FIN" :
- Typo Helvetica
- Hauteur des caractères : 1.5 mm
- Couleur : blanche
- NB pour le positionnement de ces éléments se référer au contenu du CD-ROM

Espace banque (peut se réaliser en post-marquage)

Logo banque : impression quadri ou monochrome blanche
Programme banque : impression quadri ou monochrome blanche

VERSO

Informations légales
Typo Avant Garde medium
Couleur : noire
Mention : "IMPORTANT Cette carte strictement personnelle est la propriété de la banque émettrice qui peut la retirer à tout moment. Toute personne trouvant cette carte est priée de bien vouloir l'adresser sous pli non affranchi à "
NB : dans cette phrase les mots "banque émettrice" peuvent être remplacés par le nom de l'établissement bancaire ou financier émetteur

Espace banque (peut se réaliser en post-marquage)
- Adresse du centre de traitement de la banque émettrice

POST-PERSONNALISATION

RECTO
Typo Arial ou Helvetica
- Couleur : noire

Numéro de la carte
Hauteur des caractères : 3 mm

Nom du porteur
- Hauteur des caractères 2 mm

Date d'expiration
Format bancaire
- Hauteur des caractères 3 mm

Espace banque (peut se réaliser en post-marquage)
Possibilité de marquage sur 2 lignes
Interlignage : 1.5 mm

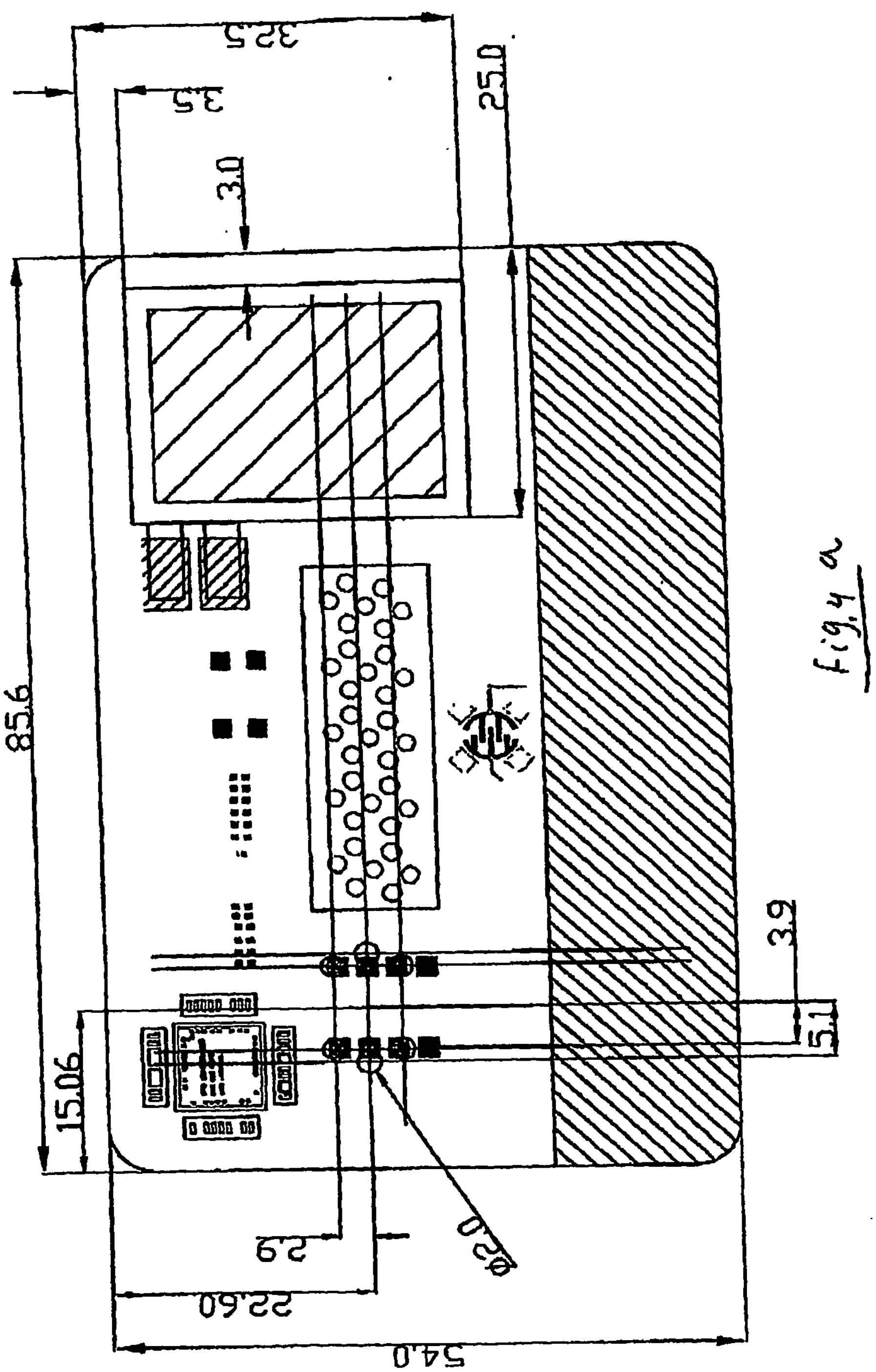
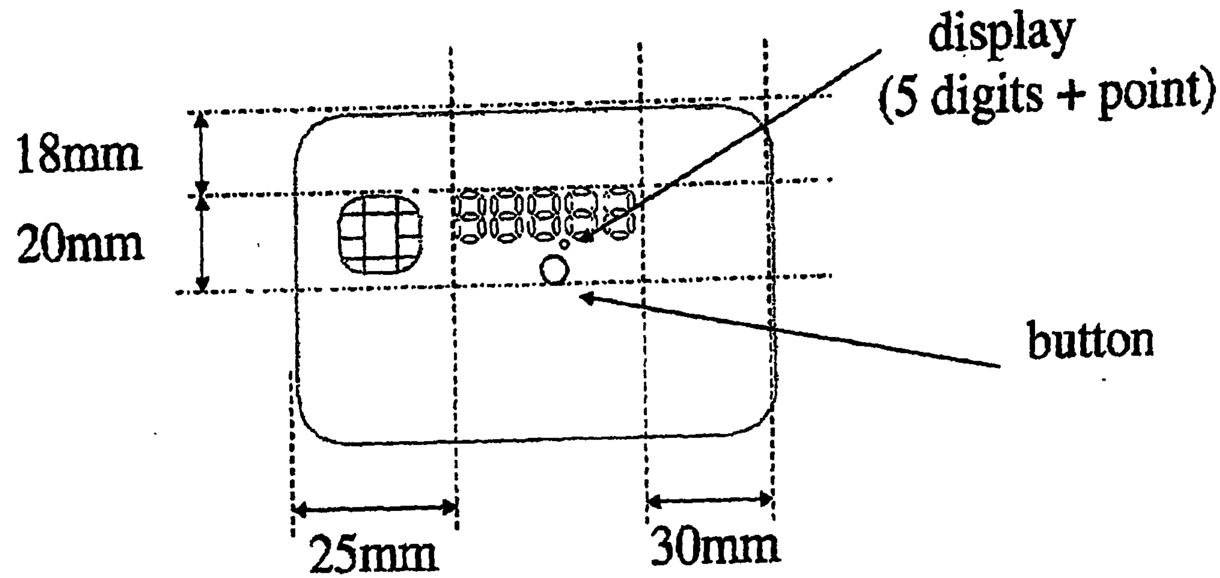


Fig. 4 a



- While a MONEO transaction: the button and the display are disable but the « internal reader » spies the I/O line to keep the Moneo informations
- Out of Moneo transaction (chip is off): the « internal reader » wake up after with a push button

-In first it displays the balance (global=bal+bal') then the historical operations
-If the holder stops to push the button then the « internal reader » stops all and

Switch off the display.

Fig. 4 b

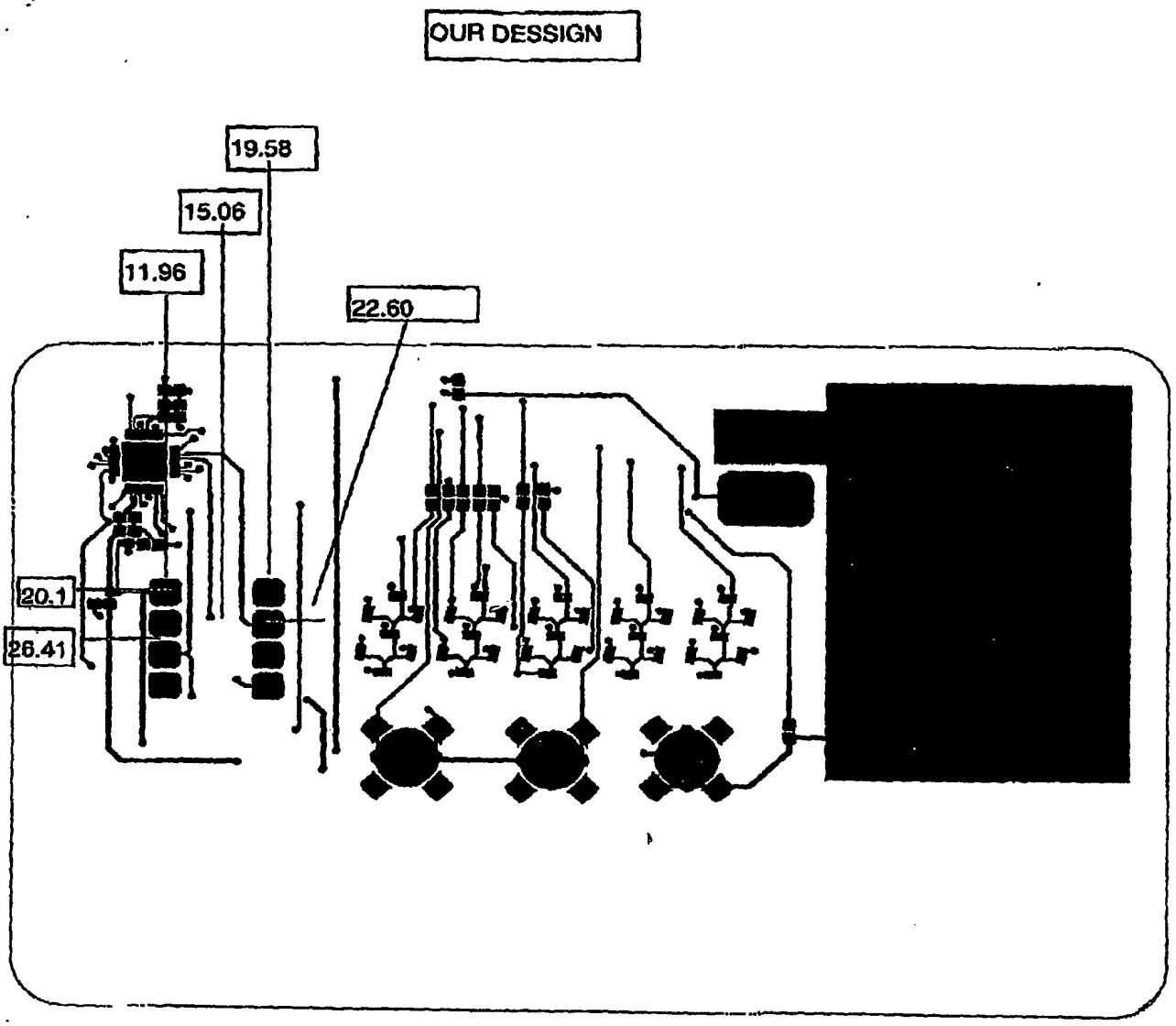


Fig. 5

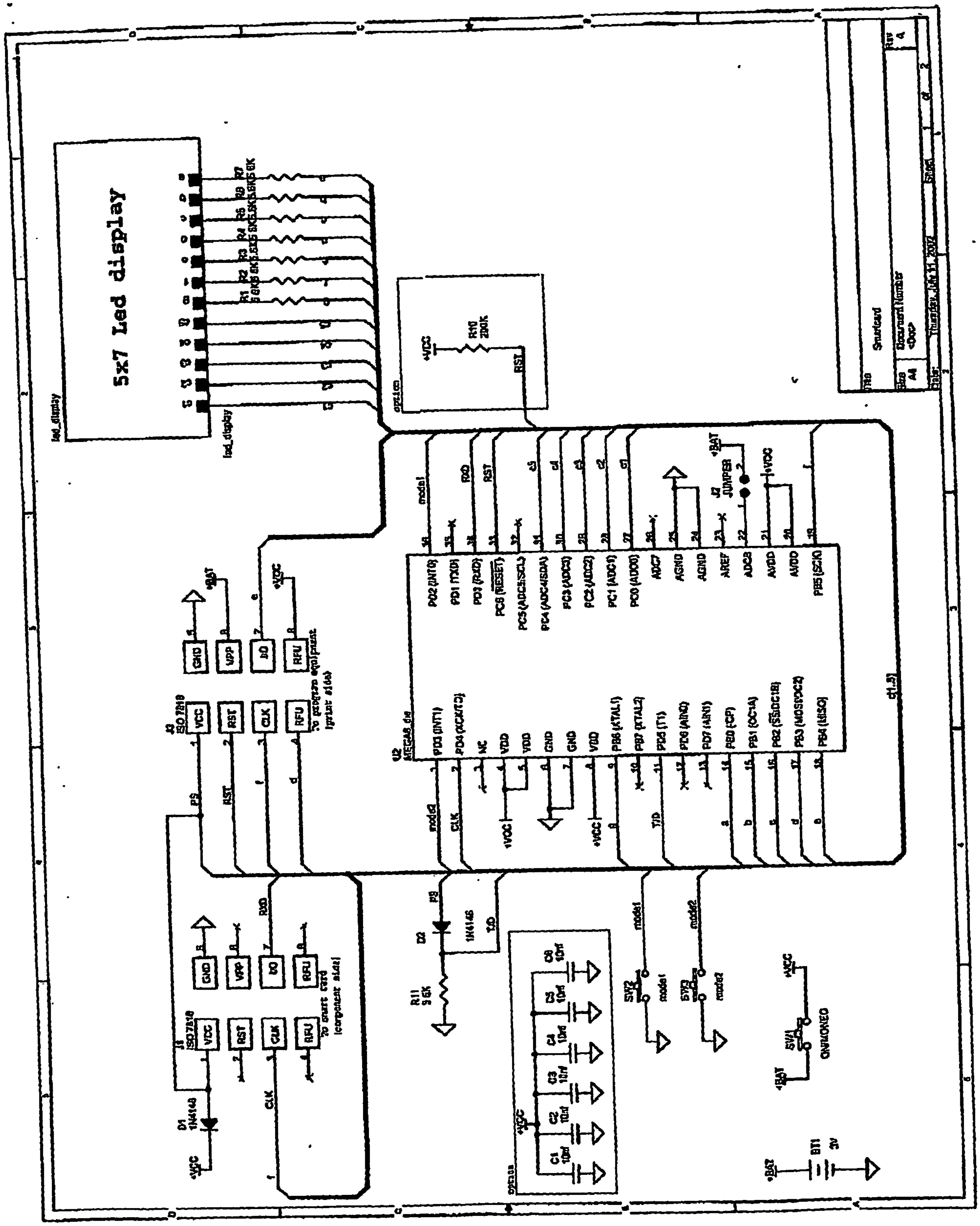

5x7 Led display
led_display
ATMEGA8_dip
ISO 7816
To program equipment (printer side)
To smart card (component side)
1N4148
Smartcard
Document Number
Thursday, July 11, 2002

fig. 6

CAD file

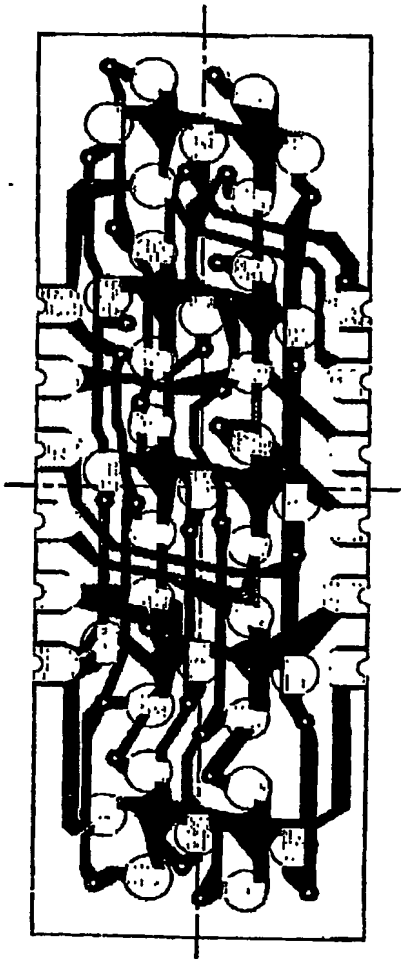


Fig. 7 a

CAD file.

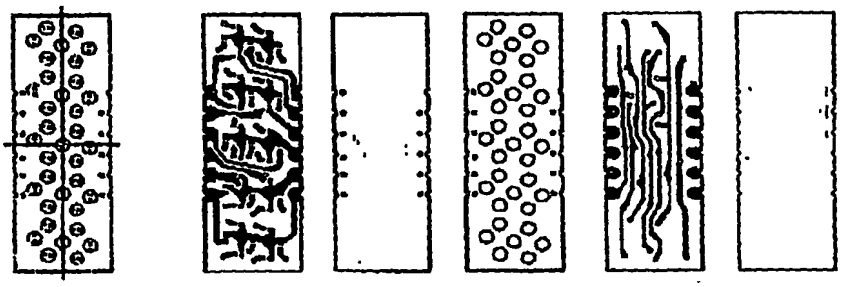


Fig. 7b

The display has 5 digits + a point

A digit has 7 segments

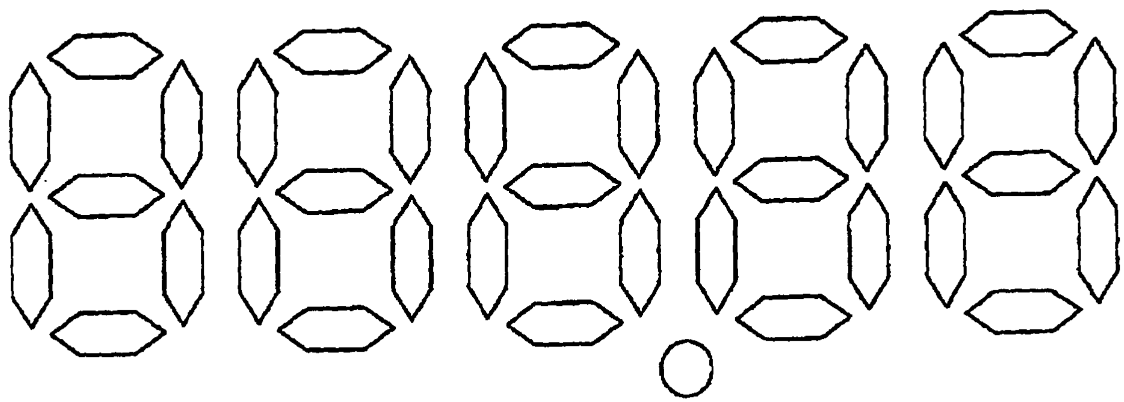
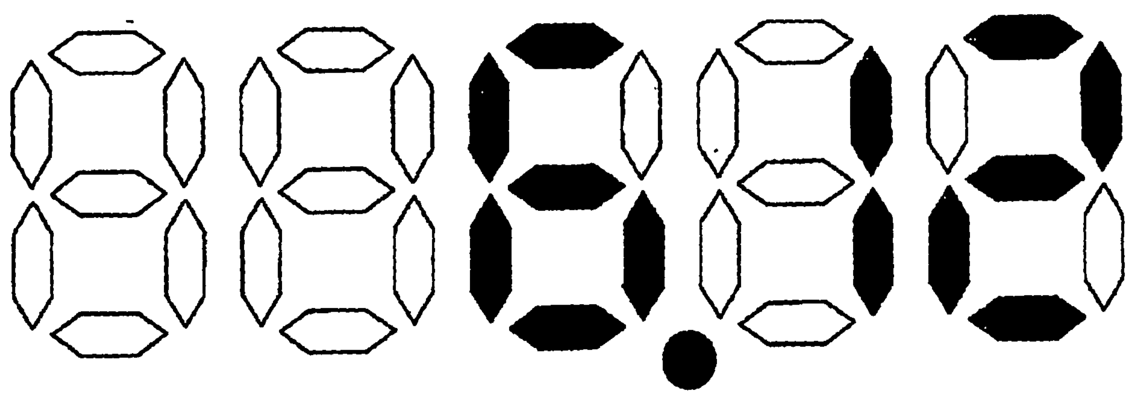


fig. 8a

We push the button : The « reader » starts

In first the display give the balance while 2 seconds



Display for the balance

Fig 8b

After it displays the historical transactions

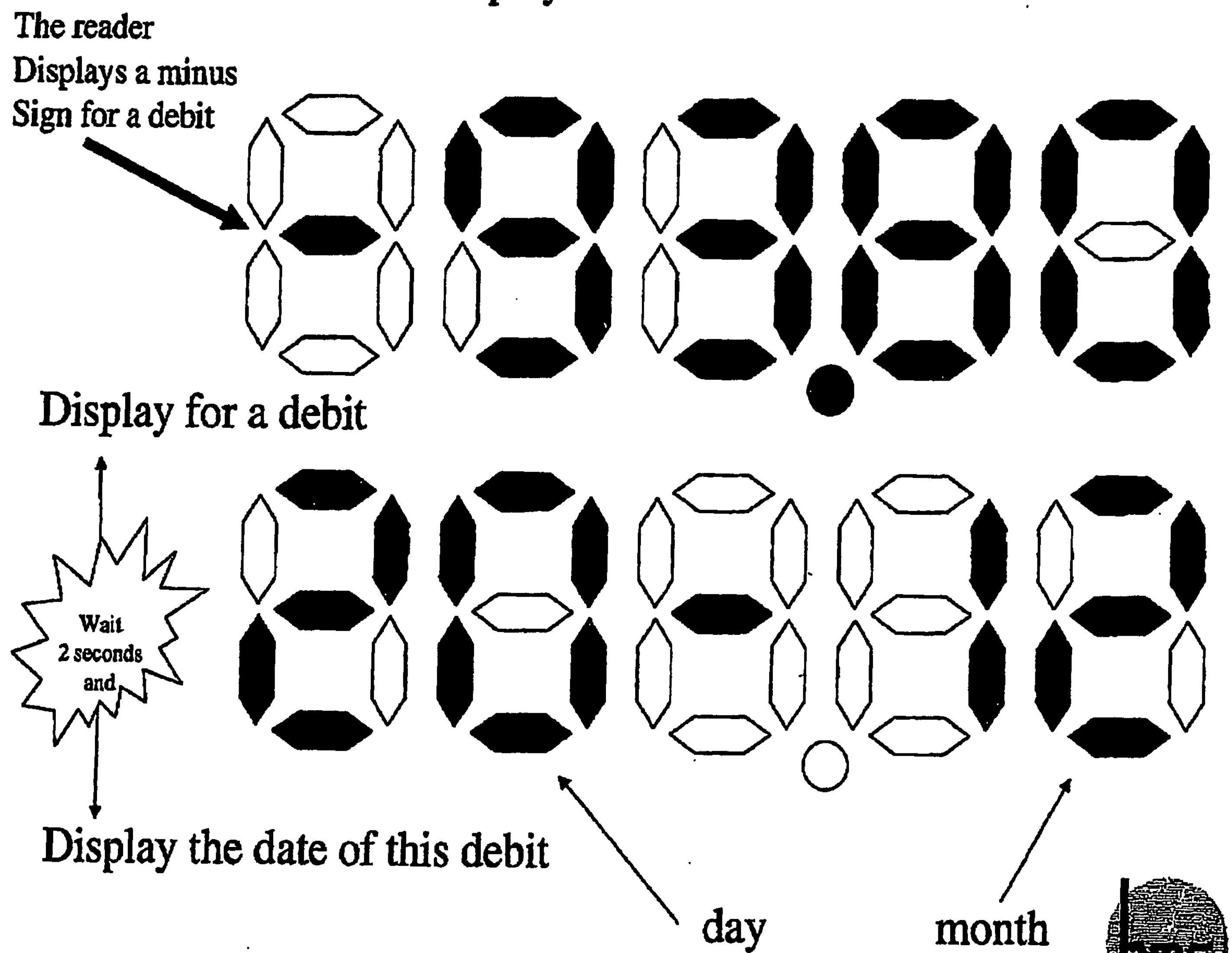


fig 8c

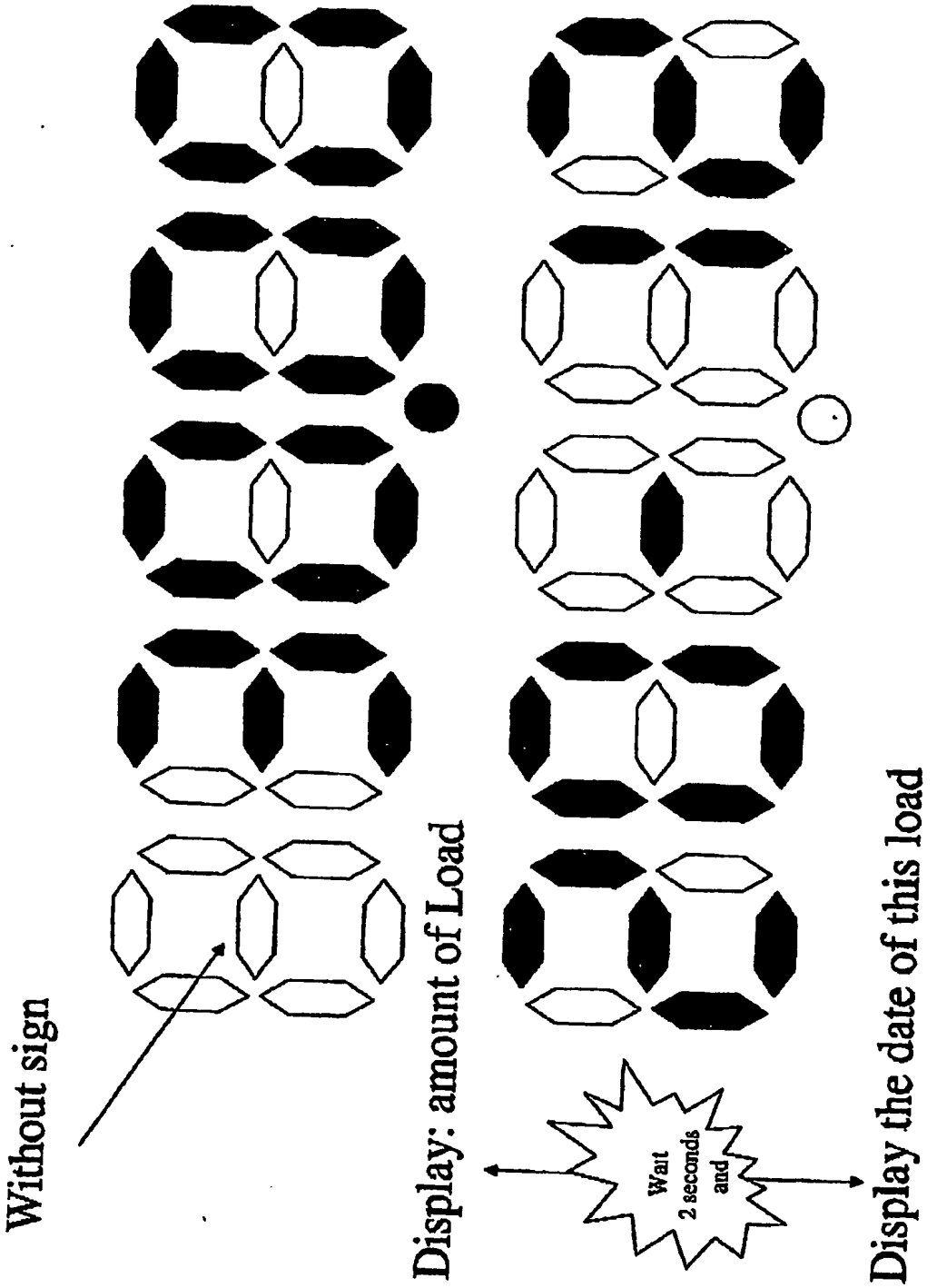

Without sign
Display: amount of Load
Wait
2 seconds
and
Display the date of this load

Fig 8d

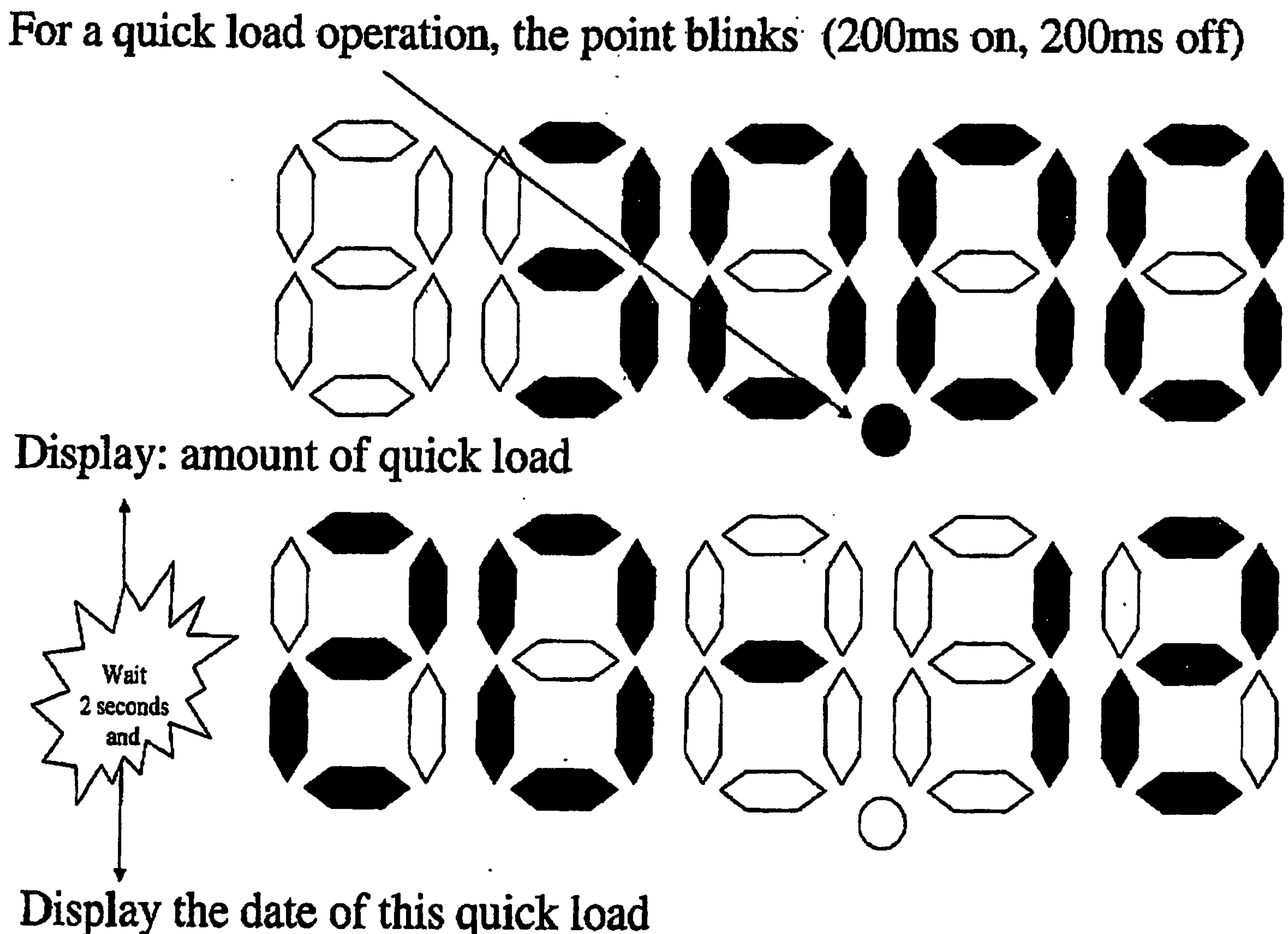

For a quick load operation, the point blinks (200ms on, 200ms off)
Display: amount of quick load
Wait
2 seconds
and
Display the date of this quick load

Fig. 8e